CDT & Plate Tectonics Study Guide

Continental Drift Theory

- Alfred Wegener was a German scientist who proposed the Theory of Continental Drift in 1910.

- **<u>Continental Drift Theory</u> is the idea that all of the continents were once joined together in a single landmass called Pangaea and have since drifted apart.**

- Wegener gathered evidence to support Continental Drift Theory:
    - The continents appear to fit together like a puzzle.
    - Africa and South America had the same mountain ranges on their coasts.
    - Glossopteris plant fossils were found on many continents that are now separated. They were also found in Antarctica . This suggests that Antarctica must have been closer to the equator and warmer to support plant life.
    - Evidence of glaciers were found in parts of Africa close to the equator. This suggests that Africa was much closer to the South Pole and a colder climate millions of years ago.

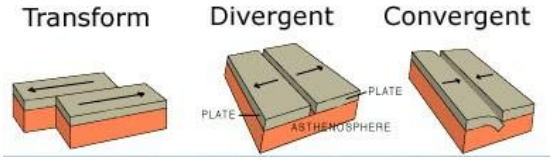
- Alfred Wegener's Continental Drift Theory was NOT ACCEPTED because he could not provide an explanation for the FORCES that pushed or pulled the continents.

Theory of Plate Tectonics

- **The <u>theory of plate tectonics</u> states that the Earth's outermost layer, the lithosphere, is broken into slabs called plates. These plates are in constant motion.**

- There are two types of plates:
    - Continental plates - exist under the continents
    - Oceanic plates - exist under the oceans

- Oceanic plates are <u>more dense</u> and <u>sink</u> beneath the continental plates. The three plate boundaries are divergent, convergent and transform.



- Divergent-plates move away from one another.
- Convergent-plates collide or come together.
- Transform-plates slide past one another in opposite directions.
- Subduction is when two plates collide at a convergent boundary and the denser plate goes under.

Sea Floor Spreading

- **Sea-Floor Spreading is the process by which magma rises and adds new oceanic crust to the ocean floor.**

- A *mid-ocean ridge* is an underwater mountain range that forms when magma seeps up through the ocean floor, cool and hardens into igneous rock.
    - Iceland is an example of the Mid-Atlantic Ridge that has risen above the Atlantic Ocean.

- New rock is formed at the center of the ridge and pushes old rock away from the ridge.

- The continents are carried along by the seafloor causing them to drift just as Alfred Wegener suggested!

Subduction

- **Subduction is a process that occurs at convergent boundaries where the denser, oceanic plate bends down below a continental plate.**

- Subduction occurs at deep ocean trenches as the DENSE older rock furthest from the ridge begins to bend downward back into the mantle. It melts into magma again.

- *Deep ocean trenches* form at subduction zones.

Fossils

- A *fossil* is the preserved remains or evidence of ancient living things.

- Be able to identify the types of fossils: preserved remains, carbon film, mold and cast, petrified

- Fossils are formed when an organism dies and becomes buried QUICKLY.

- A fossil is more likely to form when it has HARD PARTS such as bones, shells or teeth.

- Fossils provide evidence of:
    - how living organisms have changed over time.
    - how the Earth's environment has changed over time.
    - how the climate of a region has changed over time.

    ***Study your notes and be able to make inferences based on fossil evidence.

- Fossils are mainly found in sedimentary rock.

Law of Superposition and Index fossils

- Law of Superposition states that in sedimentary rock layers, the older rock is at the bottom and the younger rock is at the top.

- Students should be able to look at diagrams of sedimentary rock containing fossils and compare the relative age of rock layers and fossils.

- Index fossils are used to determine relative age. To be classified as an index fossil, the fossil must be widely distributed(many places) and lived for a short time (only in one rock layer).

- Students should be able to identify index fossils and provide an explanation for how they know if a fossil is an index fossil.

Use your binder and resources on the Google Site to help you study!

Law of Superposition

- **In sedimentary rock, the older layers of rock are deposited first.**
- Newer layers are deposited after the older layers.
- Therefore, **newer layers are formed on top of older layers of rock**.
- Observing an undisturbed layer of rock, you can assume that the **older rocks are at the bottom and the youngest are at the top**.